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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/053,237	04/01/1998	EARL COHEN	CIS-032-B	1056

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EXAMINER
ELALLAM, AHMED

ART UNIT	PAPER NUMBER
2662	

DATE MAILED: 12/04/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/053,237	Applicant(s) COHEN, EARL	
	Examiner AHMED ELALLAM	Art Unit 2662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 September 2001* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,9,11,12,15-18,20,21,23-27,29-35 and 37-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,9,11,12,15-18,20,21,23-27,29-35 and 37-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

This is responsive to the amendment filed on September 12, 2001. The amendment has been entered.

Information Disclosure Statement

1. It has been **twice** indicated in the previous office actions that the information disclosure statements filed on May 10, 1999 and June 16 fail to comply with 37 CFR 1.98(a)(1), which requires a list of all patents, publications, or other information submitted for consideration by the Office. It has been placed in the application file, but the information referred to therein has not been considered. For the references to be considered they must be listed on **PTO Form 1449.**

Claim Objections

2. Claim 25, the phrase "wherein the at least one ordered packet flow" lacks antecedent basis. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1, 11, 25 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable

one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding claim 1, the specification does not adequately describe the feature of "means for determining the original order of the packets in the same flow from the network layer information". More specifically the specification does not describe the means that determine the original order of the packets". Similarly the feature of " means for preserving the original ordered packet flows to a single route processing engine" is not adequately described in the specification. The specification does not describe preserving the original ordered packet. See **RESPONSE TO ARGUMENTS** below.

Regarding claim 11, the specification does not adequately describe the feature of "wherein the hashing function determines the packets' original order from the network layer information including at least the same source/destination and protocol". More specifically the determination of the packets original order is not described.

Regarding claim 25, the specification does not adequately describe the feature of "ordered packet flow comprises a plurality of ordered packet flows, and the step of hashing is performed such that only a single respective processing engine is selected to process respective packets belonging to a respective ordered packet flow". More specifically, the specification does not describe the criterion used to have ordered packet flow among ordered packet flows to be assigned to a single processing engine.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 15 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 15 and 16, it is not clear what is meant by "network interfaces include port adapters , wherein the port adapter converts input data to a known interface". More specifically, the conversion of input data to a known interface is vague. It is not clear why such conversion is taking place and what conversion does it consist of.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1, 2, 17, 18, 20, 21, 23, 24-27, 29-35, and 37-44 are rejected under 35 U.S.C. 102(e) as being anticipated by Imai et al, US (6,175,874).

Regarding claim 1, with reference to Figures 1 and 14, Imai discloses a routing system for distributing packets in a network, the system comprising:

- a plurality of user terminals 5A, 5B,...,5M. (Corresponding to a plurality of means for transferring packets to a destination and from a source); and
- a plurality of processing nodes, 3A, 3B, ..., 3N, and

- a relay device 1 that comprises a distribution control table 10, the distribution control table stores information for selecting processing nodes (processing engines) by hashing using some pattern relating to the transmission origin and destination of packets, see column 3, lines 45-62. Imai also discloses that the relay device distributes a received packet to a selected processing node from among nodes 3A-3N using the protocol type, transmission origin address (source address), transmission origin port, and destination port, see column 4, lines 57-64. Imai further discloses that packet of the same VC (virtual connection), the packet is delivered to the same processing node.

(Corresponding to a mechanism that performs a hashing function on at least a portion of network layer information, in the packet transferred to the routing system, to determine an approximately even distribution of the packets to the route processing engines for processing by the engines, and means for determining packets belonging to the same flow and their original order from the network layer information of the packets, the network layer information including at least the same source/destination and protocol, and means for preserving the original ordered packet flows by sending each ordered packet flow to a single route processing engine).

Regarding claim 2, as understood, with reference to Figure16, Imai discloses an external network 4, Imai also discloses routing Internet traffic, see column 4, lines 30-35.

Regarding claim 17, Imai discloses a method for selecting one processing node of a plurality of processing nodes 3A, 3B, ..., 3N, for processing at least one packet the method comprising:

-a relay device 1 that comprises a distribution control table 10, the distribution control table stores information for selecting processing nodes (processing engines) by hashing using some pattern relating to the transmission origin and destination of packets, see column 3, lines 45-62. Imai also discloses that the relay device distributes a received packet to a selected processing node from among nodes 3A-3N using the protocol type, transmission origin address (source address), transmission origin port, and destination port, see column 4, lines 57-64. Imai further discloses that packet of the same VC (virtual connection), the packet is delivered to the same processing node. (Corresponding to hashing at least a portion of network layer information of at least one packet to determine a distribution of packets to the processing engines; determining from the network layer information, including at least the source/destination and protocol, the at least one packet that belongs to an ordered packet flow, and selecting the one processing engine to process the at least one packet thereby preserving the ordered packet flow).

Regarding claim 18, Imai discloses that the relay device distributes a received packet to a selected processing node from among nodes 3A-3N using the protocol type, transmission origin address (source address), transmission origin port, and destination port, see column 4, lines 57-64. (Corresponding to the network layer flow information comprises one or more of the following network information: a network source address

of the at least one packet, a network destination address of at least one packet, a source port of at least one packet, and a protocol type value of at least one packet).

Regarding claim 20, Imai discloses pattern matching and hashing. Therefore logically XORing the addresses, the port, and the protocol value is inherent to Imai because it is needed for pattern matching.

Regarding claim 21, with reference to Figure 2, Imai discloses a pattern table that that stores information indicating the transfer address/port as arguments for the hash function, a node table 10N in combination with the pattern table, the node table is a hash table with processing nodes as an index of hash results. See column 4, lines 65-67 and column 5, lines1-14. (Corresponding to providing a table containing entries for use in selecting the one processing engine; and selecting one entry in the table specified by an index value, the index value being based upon the hash value, and using the index value to direct the selection of the one processing engine for those related packets that belong to the same packet flow).

Regarding claim 23, Imai discloses that it is possible to easily change the distribution destination of packets, considering the circumstances of processing load dispersion, kinds of packets or nodes. See column 12, lines 15-31. (Corresponding to the at least one packet is the one of a plurality of packets, and the step of hashing is performed using a hashing function that causes the packets to be at least mostly evenly distributed among the processing engines).

Regarding claim 24, Imai discloses that the processing nodes are comprised in a routing system, see Figure 16 and column 2, lines 1-3.

Regarding claim 25, as understood, Imai discloses a relay device 1 that comprises a distribution control table 10, the distribution control table stores information for selecting processing nodes (processing engines) by hashing using some pattern relating to the transmission origin and destination of packets, see column 3, lines 45-62. Imai also discloses that the relay device distributes a received packet to a selected processing node from among nodes 3A-3N using the protocol type, transmission origin address (source address), transmission origin port, and destination port, see column 4, lines 57-64. Imai further discloses that packet of the same VC (virtual connection), the packet is delivered to the same processing node. (Corresponding to at least one ordered packet flow comprises a plurality of original ordered packet flows, and the step of hashing is performed such that only a single respective processing engine is selected to process respective packets belonging to a respective ordered packet flow).

Regarding claims 26, 27, 29, 30, 31, 34, 32 and 33, claim 26, 27, 29, 30, 31, 34, 32 and 33 have substantially the same claim limitations as in claims 17, 18, 20, 21, 25, 25, 23 and 24 respectively, thus they are subject to the same rejection.

Note: claims 29 and 30 are treated as if they depend from claim 26 and not 28. See the objection remarks above.

Regarding claims 35, 37-43, claims 35, 37-43 have substantially the same scope of claims 17, 18, 20-25, thus they are subject to the same rejection.

Regarding claim 44, claim 44 has similar scope as in claim 1, thus it is subject to the same rejection.

Claim Rejections - 35 USC 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imai.

Regarding claim 11, with reference to Figures 1 and 14, Imai discloses a routing system for distributing packets in a network, the system comprising:

- a plurality of user terminals 5A, 5B,...,5M. (Corresponding to a plurality of means for transferring packets to a destination and from a source); and
- a plurality of processing nodes, 3A, 3B, ..., 3N, and
- a relay device 1 that comprises a distribution control table 10, the distribution control table stores information for selecting processing nodes (processing engines) by hashing using some pattern relating to the transmission origin and destination of packets, see column 3, lines 45-62. Imai also discloses that the relay device distributes a received packet to a selected processing node from among nodes 3A-3N using the protocol type, transmission origin address (source address), transmission origin port, and destination port, see column 4, lines 57-64. Imai further discloses that packet of the same VC

(virtual connection), the packet is delivered to the same processing node. It is inherent to Imai's system to include a plurality of network interfaces, because they are needed for different components of the system to interface other entities such as interfaces between user terminals and the External network (See Figure 1).

Imai also discloses that the relay device interconnect the user terminals and the plurality of processing nodes.

Imai does not disclose that each plurality of network interfaces uses a hashing function to determine a distribution of packets among the plurality of processing nodes.

However, it would have been obvious to an ordinary person of skill in the art, at the time of the invention to have Imai hashing mechanism distributed and carried out at network interface units so that distributed processing (hashing) can be implemented.

Regarding claim 9, Imai does not explicitly disclose that his routing system is scalable, however, it would have been obvious to a person of ordinary skill in the art, at the time of the invention, to render Imai's system scalable as suggested by Imai's system structure of distributed processing nodes.

9. Claims 3 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imai in view of Varghese et al, US (5,905,723).

Regarding claims 3 and 12, Imai discloses substantially all the limitations of claim 3 and 12, except that Imai does not discloses that the relay device includes a crossbar.

However, with reference to Fig .1 and 2, Varghese discloses a scalable routing system for distributing packets in a network, comprising a crossbar switch interconnecting the network interfaces and the FE (forwarding engines).

Therefore, it would have been obvious to an ordinary person of skill in the art, at the time of the invention to have the relay device of Imai to include the crossbar switch of Varghese so that routing of data would be much faster.

Response to Arguments

10. Applicant's arguments with respect to the claims have been considered but they are not persuasive.

Applicants argues that claims 1 and 11 are amended to more specifically point out that *the packet headers are inspected to determine those packets belonging to the same flow and the original order of these packets belonging to the same flow. (the other independent claims 17, 26, 35 and 44 also have this limitation).* Examiner respectfully likes to point out that the specification does not adequately describe the determination and /or preservation of the order of packets belonging to the same flow. In the body of the specification, on page 12, lines 16-19, it is stated: *The hash function distributes packets evenly among the processors in response to flow information such as the source/destination address, the source destination port, and the protocol. The hash function can operate using any information that will allow for flow preservation.* Applicant argues that order is necessary to such preservation by quoting the phrase : *The hash function can* operate *using any information that will allow for flow preservation.*

It follows that such passage does not adequately explain the determination and /or preservation of the order of packets belonging to the same flow as well as the distribution of "ordered" packets. The use of "any information" does not in anyway support Applicant claims.

Examiner, given the remarks above, respectfully likes to indicates that prior art of Imai discloses: a relay device that comprises a distribution control table 10, the distribution control table stores information for selecting processing nodes (processing engines) by hashing using some pattern relating to the transmission origin and destination of packets, see column 3, lines 45-62. Imai also discloses that the relay device distributes a received packet to a selected processing node from among nodes 3A-3N using the protocol type, transmission origin address (source address), transmission origin port, and destination port, see column 4, lines 57-64.

Therefore, by analogy of Imai reference to Applicant disclosure, Examiner believes that the art rejection in the previous office action is maintained as valid.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AHMED ELALLAM whose telephone number is (703) 308-6069. The examiner can normally be reached on 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kizou Hassan can be reached on (703) 305-4744. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

AHMED ELALLAM
Examiner
Art Unit 2662
November 29, 2001

HASSAN KIZOU
SUPERVISORY PATENT EXAMINER
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